

REMARKS

This application has been reviewed in light of the Office Action mailed on November 4, 2002. Claims 1-6 are pending in the application with Claims 1 and 6 being in independent form. By the present amendment, Claims 1-4 and 6 have been amended and Claim 5 has been cancelled. No new matter or issues are believed to be introduced by the amendments.

In the Office Action, Claim 5 was objected to. In order to expedite the allowance of the present application, Claim 5 has been cancelled. Accordingly, withdrawal of the objection is respectfully requested.

Claims 1-6 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,852,646 issued to Klotz et al. on December 22, 1998 ("Klotz et al.") in view of U.S. Patent No. 6,324,254 issued to Pflaum on November 27, 2001 ("Pflaum").

Applicants have amended Claims 1 and 6 to better define Applicants' invention and in a manner which is believed to obviate the rejection. Specifically, Claim 1 has been amended to recite "An X-ray imaging method comprising the steps of: forming a set of 2-dimensional X-ray images of an object to be examined, for example the coronary vascular system of a patient, by means of a scan rotation of an X-ray source around said object over a run length, said X-ray images being acquired at predetermined characteristic time moments in a cardiac cycle of the object; and reconstructing a 3-dimensional volume of the imaged object, wherein the run length of the scan rotation over substantially 180° is at least 15 s and preferably about 20 s and reducing the number of measuring points in successive cardiac cycles." (Emphasis added) Similar language has been added to Claim

6.

Klotz et al. and Pflaum, taken alone or in combination, do not disclose or suggest at least an X-ray imaging method or apparatus which acquires X-ray images at predetermined characteristic time moments in a cardiac cycle of an object, and reconstructing a 3-dimensional volume of the imaged object, wherein the number of measuring points in successive cardiac cycles is reduced, as recited by Applicants' Claims 1 and 6. Accordingly, withdrawal of the rejection with respect to Claims 1 and 6 and allowance thereof are respectfully requested.

Claims 2-4 depend from Claim 1 and therefore include the limitations of Claim 1. Therefore, for at least the same reasons given above for Claim 1, Claims 2-4 are believed to be allowable over the cited references. Accordingly, withdrawal of the rejection with respect to Claims 2-4 and allowance thereof are respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-4 and 6, are believed to be in condition for allowance and patentably distinguishable over the art of record.

Attached hereto and identified as VERSION WITH MARKINGS TO SHOW CHANGES MADE is a copy of the amended claims detailing the amendments made thereto.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call John Vodopia, Esq., Intellectual Property Counsel, Philips Electronics North America, at 914-333-9627.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Amended) An X-ray imaging method comprising the steps of:
forming a set of 2-dimensional X-ray images [(18)] of an object to be examined, for example the coronary vascular system of a patient, by means of a scan rotation of an X-ray source [(12)] around said object over a run length [(20)], said X-ray images [(3)] being acquired at predetermined characteristic time moments in a cardiac cycle [(ED)] of the object; and
[reconstruction of] reconstructing a 3-dimensional volume [thereof] of the imaged object, [characterized in that] wherein the run length [(20)] of the scan rotation over substantially 180° is at least 15 s and preferably about 20 s and reducing the number of measuring points in successive cardiac cycles.
2. (Amended) An X-ray imaging method according to claim 1,
[characterized in that] wherein, before [reconstruction] the reconstructing step, images obtained at predetermined corresponding characteristic time moments in successive cardiac cycles are correlated with each other.
3. (Amended) An X-ray imaging method according to claim 2,
[characterized in that] wherein the characteristic time moments substantially correspond to R-peaks of the cardiac cycle.

4. (Amended) An X-ray imaging method according to claim 1, [characterized in that] wherein, before [a reconstruction] the reconstructing step, images obtained at predetermined neighbouring time moments in a predetermined characteristic time interval of a cardiac cycle are correlated with each other.

6. (Amended) 3D-rotational X-ray apparatus [(1)] for applying the method according to claim 1, comprising a circular C-arm [(10)] with a drive, the C-arm accommodating an X-ray source [(12)] and an X-ray image pick-up device [(13)] and being rotatable over an angle of substantially 180° around its center by means of said drive, triggering means for triggering the X-ray images at predetermined characteristic time moments in [the] a cardiac cycle of the object, wherein the number of measuring points in successive cardiac cycles is reduced, and means for processing the images obtained to reconstruct a 3-dimensional volume of the object, [characterized in that] wherein the drive of the C-arm [(10)] is adjusted to a run length of a scan rotation over substantially 180° which is at least 15 s and preferably about 20 s.